

**AMENDMENTS TO THE DRAWINGS:**

The attached replacement drawings sheets made changes to Figs. 2, 3 and 4 and replaces the original Figs. 2, 3 and 4. Fig. 2 is amended to include the legend "Prior Art." Figs. 2 and 4 are amended to include a description of the boxes. Fig. 3 is amended to include a description of the axes.

## REMARKS

Favorable reconsideration of this application is respectfully requested.

Claims 1-9 are pending. By this Amendment, the specification and drawings are amended and claims 1 and 2 are amended.

The Office Action objects to the specification. The specification and abstract are amended to address the Examiner's concerns.

The Office Action objects to the drawings. Fig. 2 is amended to be labeled "Prior Art". Figs. 2 and 4 include amendments to label the block elements. Fig. 3 is amended to label the axes.

The Office Action objects to claims 1-9. Claims 1 and 2 are amended to address the concerns of the Examiner.

The Office Action rejects claims 1-9 under 35 U.S.C. § 103(a) over present Applicant's U.S. Patent No. 5,920,014 (Waschkies) in view of U.S. Patent No. 3,868,847 (Gunkel), Applicant's U.S. Patent No. 5,920,014 is believed to correspond with DE 43 25 878 which is cited and discussed on page 1 of the present specification. The foregoing rejection is respectfully traversed.

Neither the Waschkies nor Gunkel patents disclose or suggest a method for evaluating a welding joint as the welded joint is forming wherein sound is transmitted with longitudinal and transverse ultrasonic waves into a region of the welded joint as recited in Applicant's independent claim 1. Such a feature encompasses Applicant's exemplary embodiment as illustrated in Fig. 1a wherein two flat metal sheets 1, 2 of a joint are in contact and form a metal sheet/metal sheet contact, B-B. For energy input to form a temperature dependent welded spot between the two parts 1, 2 of the joint, welding electrodes 3, 4, are respectively placed on the corresponding sides of the metal sheets to create an electrode/metal sheet contact, E-B as disclosed in

Applicant's specification at page 9, the paragraph beginning at line 18. The inferior indices  $i$  and  $t$  of the mathematical equations 1 and 2 indicate the sound transmittance through the individual contacts of the longitudinal waves ( $l$ ), and respectively transverse waves ( $t$ ).

The Waschkies patent discloses a process for assessing welded joints using a transverse ultrasonic waves.

As disclosed in the Gunkel patent, at the paragraph beginning at line 66 of column 6, boundary zones of a weld are defined as the zones adjacent the I.D. and O.D. boundaries between the weld and adjacent plate. The heart of the weld is labeled as H. As disclosed in the Gunkel patent, a specific inspection of the I.D. and O.D. boundary zones  $Z_{ID}$  and  $Z_{OD}$  is provided by shear wave inspection simultaneously with inspection of the heart of the weld and plate adjacent the weld by longitudinal wave inspection. The Gunkel patent uses a combination of types of ultrasonic inspection to provide inspection. The Gunkel patent clearly discloses that the zones  $Z_{ID}$  and  $Z_{OD}$  are evaluated by shear inspection, wherein the heart H is evaluated by longitudinal wave inspection. The Gunkel patent does not perform inspections of a welded joint as it is forming and instead discloses the inspection of already formed welds.

Thus, combination of the Waschkies and Gunkel patents would not have disclosed or suggested sounds transmitted with longitudinal and transverse ultrasonic waves into a region of a welded joint as recited in Applicant's present claim 1. Moreover, one of ordinary skill would not have been motivated to combine features of these patent in the manner suggested by the Examiner, because the Waschkies patent is concerned with welds as they form, whereas the Gunkel patent is concerned with already formed welds. Applicant's claim 1 is therefore allowable.

The remaining dependent claims are allowable for at least the reasons discussed above as well as for the individual features they recite. For example, claim 3 recites

$$\frac{D_i(t)}{D_t(t)} = \frac{(EB)_i(t) \cdot (BB)_i(t) \cdot (BI)_i(t) \cdot (BE)_i(t)}{(EB)_t(t) \cdot (BB)_t(t) \cdot (BI)_t(t) \cdot (BE)_t(t)} \approx \frac{(EB)_i^2(t) \cdot (BB)_i(t)}{(EB)_t^2(t) \cdot (BB)_t(t)} \approx \frac{(BB)_i(t)}{(BB)_t(t)}$$

with  $(EB)_{i \text{ or } t}(t) \equiv$  sound transmittance of longitudinal waves or transverse waves at the sound coupling - in area on the first part of a joint  
 $(BB)_{i \text{ or } t}(t) \equiv$  sound transmittance of longitudinal waves or transverse waves at the contact between the parts of a joint  
 $(BI)_{i \text{ or } t}(t) \equiv$  sound transmittance of longitudinal waves or transverse waves inside the parts of a joint  
 $(BE)_{i \text{ or } t}(t) \equiv$  sound transmittance of longitudinal waves or transverse waves at the sound couplingout area on the second part of a joint

with  $(BI)_{i \text{ or } t}^2(t)$  and  $(EB)_{i \text{ or } t}^2(t)$  of the longitudinal waves and the transverse waves being largely the same provided that frequencies are low and the transmission paths are short. These features are not disclosed or suggested by the Waschkie or Gunkel patents either alone or in combination.

Early and favorable action with respect to this application is respectfully requested.

Should any questions arise in connection with this application, or should the Examiner believe that a telephone conference with the undersigned would be helpful in resolving any remaining issues pertaining to this application, the undersigned respectfully requests that he be contacted at the number indicated below.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

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